

CLAIMS

- 1) An integrated apparatus for optical monitoring of semiconductor workpiece for process control in the semiconductor production process, comprising;
 - a supporting assembly for supporting said workpiece
 - an optical monitoring unit accommodated opposite the surface of said workpiece and separated therefrom by an optical window, said optical monitoring unit is mounted for reciprocating movement within a plane parallel to said window for monitoring at least one desired parameter of said semiconductor workpiece and having a pattern recognition and an auto-focusing utilities;
 - wherein said optical window comprises one or a plurality of relatively small window fragments located in pre-determined locations to enable observation of desired pre-determined portions of said workpiece,
 - and wherein the size and shape of said window fragments are selected according to the requirements of transparency in a pre-determined spectral range, mechanical strength and ability of pattern recognition and auto-focusing.
- 2) Integrated apparatus according to claim 1 wherein said desired portions of the workpiece include the center and part of the edge of said workpiece.
- 3) Integrated apparatus according to claim 2 wherein at least one of said optical window fragments is of a circle's sector shape.

- 4) Integrated apparatus according to claim 2 wherein at least one of said optical window fragments is of a rectangular shape.
- 5) Integrated apparatus according to claims 4 wherein said window fragments comprise at least one additional window fragment having a bent strip-like shape around the workpiece' edge
- 6) Integrated apparatus according to claim 1 wherein said optical monitoring unit comprising a spectrophotometer.
- 7) Integrated apparatus according to claim 1 wherein said optical monitoring unit comprising an ellipsometer.
- 8) Integrated apparatus according to claim 1 wherein said semiconductor workpiece is a wafer.
- 9) An integrated apparatus according to claim 1 for optical monitoring semiconductor workpiece having an axis of symmetry, wherein said supporting assembly is mounted for substantially slow rotation.
- 10) A method for optical monitoring semiconductor workpiece having an axis of symmetry for process control in the semiconductor production process comprising the steps of;

optical scanning the workpiece using movable optical unit through optical window designed as a plurality of relatively small fragments located in pre-determined locations to enable observation of desired portions of the workpiece, wherein the size and shape of said fragments being selected

according to the requirements of transparency in the pre-determined spectral range, mechanical strength and ability of pattern recognition and auto-focusing;

and defining at least one desired parameter of said semiconductor workpiece at said desired portions of the.

- 11) Method for optical monitoring semiconductor workpiece according to claim 10 wherein said desired portions of the workpiece include the center and part of the edge of said workpiece.
- 12) Method for optical monitoring semiconductor workpiece according to claim 10 further comprising rotation of said workpiece by a pre-determined angle.
- 13) Method for optical monitoring semiconductor workpiece according to claim 10 wherein the track of said optical scanning is designed in such manner that enables pattern recognition and autofocusing.
- 14) Method for optical monitoring semiconductor workpiece according to claim 10 wherein said workpiece has a multi-layer structure and at least one desired parameter is a thickness of at least one of the workpiece' layers.
- 15) Method for optical monitoring semiconductor workpiece according to claim 14 wherein said optical scanning includes measuring of spectral characteristics of light response of the scanned portions of the workpiece.